



IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

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APPLICANT: DESHOTEL TITLE: Improved Welding Machine
SERIAL NO.: 09/517,258 ART UNIT: 1725
FILING DATE: March 2, 2000 EXAMINER: Z. Pittman
DOCKET NO.: 9468.001

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RESPONSE

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The Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

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Dear Sir:

This is in response to the examiner's action mailed January 3, 2002 (Paper No. 5), requiring that a response be mailed to the Office before the shortened statutory period which expired on April 3, 2002. Applicant submits herewith a petition for an extension of time pursuant to 37 C.F.R. § 1.136(a) and the fee required by 37 C.F.R. § 1.17. No additional fees are believed to be due at this time. However, if any are due, the commissioner is hereby authorized and requested to charge those to Deposit Account 18-2210.

Claims 1-70 are in the case. Claims 1-15, 30-43, and 63-67 have been elected for prosecution. The remaining claims have not been examined. Claims 1-15, 30-43, and 63-67 have been rejected. The examiner's rejections are traversed, and reconsideration thereof is respectfully requested.

The examiner has rejected claims 1-5, 8-12, 15, 30-34, 37-40, 43, 63, 67, and 69 as being anticipated under 35 U.S.C. § 102(b) by U.S. Patent 4,577,088 to Sharp ("Sharp"). As the examiner is aware, to support a rejection of a claim under 35 U.S.C. § 102, the examiner must establish that every element of the claimed invention is present in a single prior art reference.

Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 1570, 7 USPQ2d 1057, 1064 (Fed. Cir. 1988); MPEP § 2131. Here the examiner has relied solely upon Sharp. However, there is at least one limitation in all of the rejected claims that is missing from Sharp.

The independent claims that have been examined are 1, 30, 38, and 63. Each of these claims are drawn to methods of *arc welding*. Each claim contains a limitation such as the requirement in claim 1 of "arcing electric current from a source of electric current to said plates, thereby melting said ends and creating a welded seam between said plates." Sharp does not disclose a method of arc welding. Instead, Sharp discloses a method of laser welding. *See*, Sharp, Abstract; Col. 5, ll. 15-20; Col. 6, ll. 25-35; Col. 10, ll. 15-50. As the examiner is undoubtedly aware, arc welding uses an electric current to melt the materials and effect the weld. Exhibit A. As the name suggests, laser welding uses a laser beam to effect the weld. Unlike arc welding, there is no electric current involved. Rather, a laser beam is used to melt the materials that are to be welded together. Exhibits B (p. 31), C, and D to this response explain the laser beam welding process. After reviewing these exhibits and reviewing Sharp, it should be clear that Sharp does not disclose a method of arc welding as required by the rejected claims.

Sharp does suggest that its methods would be useful with electron beam welding. Sharp, Col. 11, ll. 9-16. However, electron beam welding is not arc welding. Rather than simply arcing current to the material to be welded, in electron beam welding a beam of electrons is generated in an electron gun, accelerated to very high speeds (~2.3 the speed of light) and then fired into the work piece - frequently in a vacuum. The very rapid deceleration of the electrons as they enter the work piece will convert their high kinetic energy into heat energy, which is then used to melt the work piece. Exhibits B (p. 34), E, F, and G explain the electron beam welding process. Exhibit

H provides a comparison between several different welding processes including electron beam (E beam) welding and laser welding.

What is clear from the foregoing is that Sharp does not disclose a method of arc welding. Therefore, Sharp does not teach every limitation of the rejected claims. Accordingly, Sharp cannot properly support a § 102 anticipation rejection of the claims, and the applicant respectfully requests that the examiner's rejection be withdrawn.

The examiner has also rejected claims 6, 7, 13, 14, 35, 36, 41, 42, 64, and 65 for obviousness under 35 U.S.C. § 103. These claims depend from independent claims, which for the reasons stated above, should be allowable over the cited prior art. Therefore, the rejected dependent claims should also be allowable as well. See, MPEP § 2143.03. However, to the extent they are considered separately, these rejections should be withdrawn as well.

The only reference relied upon by the examiner in support of his § 103 rejection is again Sharp. As the examiner is aware, to establish that the claims are *prima facie* obvious, he must show that each limitation of the claimed invention is found in the prior art. MPEP §§ 706.02 (j); 2143.03. As noted above, the examiner has not met this burden because Sharp does not teach an arc welding process as claimed in the rejected claims. Additionally, the examiner has not shown that Sharp suggests applying pressure to the work piece at the distances behind the (non-disclosed) source of electric current specified in the rejected claims. Accordingly, the examiner has not met his *prima facie* case.

The examiner has also not shown how Sharp suggests that applying pressure to the work piece at the specified distances behind the (non-disclosed) source of electric current would be desirable, as he must to establish his *prima facie* case. MPEP § 2143.01. A thorough review of

Sharp reveals that it contains no suggestion that placing a source of pressure on the work piece at any appreciable distance behind the weld site would be desirable.

Laser welding and electron beam welding are known as high energy density welding processes. This is because with both processes, the energy is concentrated in a relatively small area, where it is efficiently transferred to the work piece. This offers numerous advantages, including a narrow weld zone. With both laser and electron beam welding, because the energy transfer is limited to a small area, the weld zone is correspondingly narrow. This can be extremely advantageous when welding near heat sensitive items, such as some electronic components. Because of the high energy density of these processes and corresponding small weld zones, heat from the weld zone will quickly dissipate without damaging the neighboring components. Other consequences of the rapid cooling of laser and electron beam welds, such as weld brittleness, are not so desirable. *See*, Exhibits B, C and G for a discussion of the foregoing points.

The quick cooling of laser and electron beam welds can be contrasted with the cooling times of the arc welds of the present invention. Arc welds are typically much wider than their laser or electron beam counterparts of comparable depth. Thus, arc welds will generally contain a larger mass of molten metal in the weld zone and have a correspondingly longer cooling time. This longer cooling time results in an extended period of vulnerability in the weld. As noted in the application, tension in the work piece itself can place pressure on the weld, which can result in weld failure or damage. One of the goals of the present invention is to hold the arc weld joints in place during their relatively long cooling times. As the weld cools, it strengthens and becomes capable of withstanding the pressure placed on it by the tension in the work piece. The rejected claims recite the preferred distances at which pressure should be applied to hold the weld in place long enough

for the desired cooling and hardening to take place.

Sharp only discloses laser and electron beam welding methods. However, there is no reason to have a source of pressure located any substantial distance behind the weld point in a laser or electron beam welding process. Because of the quick cooling times of the welds in those processes, the welds are solid shortly after the weld is formed. Thus, there would be no reason to modify the process of Sharp to include the application of pressure at the distances recited in the rejected claims.

In sum, the examiner has not pointed to anything in the prior art that suggests the desirability of applying pressure at the distances behind the weld recited in the rejected claims. In the absence of any showing of how the laser or electron beam welding process of Sharp suggests the desirability of the applicant's claimed location for applying pressure, the examiner has not met his *prima facie* case for these claims, and his rejection of them should be withdrawn as well. MPEP § 2143.01.

For the reasons stated above, I believe that all of the claims remaining in the case are allowable and an early Notice of Allowability is respectfully requested. If the examiner believes a telephone conference will expedite the disposition of this matter, he is respectfully invited to contact this attorney at the number shown below.

Dated: May 15, 2002

Respectfully submitted:



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